Space Weather Forecast

Issued on Sunday, 01 May 2022 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Strong-flare observed from sunspot on 30th that had recently rotated onto the far-side. Activity reducing, with decreasing chance of Moderate flares day 1 (1st). Slight chance G1-G2 Minor-Moderate Geomagnetic storms day 1 (1st).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High with one strong flare and four Moderate flares, all from a sunspot region which is now just beyond the northwest limb. There are four other sunspot regions on the visible disc, however these are all relatively small and stable. No Earth-directed coronal mass ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was slightly elevated to elevated, at around 500km/s, due to ongoing influence of the fast winds from a coronal hole and also the influence of a passing CME. The strength of the magnetic field carried by the wind was Moderate at first, but eased to be weak by mid-morning. The moderate strength magnetic field included brief occurrences of the magnetic field being moderately strong in the important north-south direction, and pointed southward (negative). The resultant geomagnetic activity was Active between 30/0000-06000 UTC (originally estimated as a G1/Minor Storm 0300-0600 but subsequently reassessed), then decreased to be Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at very near background levels, having declined after the recent very slight enhancement due to the moderate flare on the 29th. No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected on 30th April, due to the continue effects of a sunspot region just beyond the limb, with any flares still in the Earth's line of sight. A return to Low activity is then forecast for the remainder of the period, but this may be modified by how current and returning regions develop.

Solar Wind / Geomagnetic Activity: A CME from the Moderate flare on the 29th has the potential to give some glancing impacts at Earth on day 1 (1st). This is low confidence, however with most of the material of the CME assessed as clearly missing. Otherwise the current slightly elevated to elevated winds are expected to persist day 1 (1st), before easing day 2 92nd) onward with no further notable enhancements expected. Geomagnetic activity is forecast to be Quiet with Unsettled to Active intervals day 1 and day 2 (1st and 2nd), with a slight chance of isolated G1-G2 Minor to Moderate Storms day 1 (1st) should any CME influence be observed. Activity is then expected to decline to mainly Quiet with isolated Unsettled intervals day 3 (3rd) onward.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	1	1
Strong	G3	No	2	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	5	5	10
Very Active	R3 to R5 X	Yes	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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